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ON A NEW BRITISH SPONGE OF THE GENUS *Microciona*.

By J. G. WALLER.

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PLATES I. II.

The Sponge, which I have the pleasure of bringing before you, was found in a deep cleft on the under side of a boulder of the New Red Sandstone, off Paignton, in Torbay, at about the ordinary low tide mark. The locality is well known to our naturalists, both past and present. The Rev. Charles Kingsley, in his "Glaucus," has eloquently descanted on the abundant riches of the place, which afforded him much enjoyment in the study of natural history. Following the retiring tide, especially if it be at the equinox, you have ample leisure for an examination of those fringes of the rocks where a certain class of sponges are found in considerable quantity. These are for the most part "coating sponges," or those which like to fix themselves in narrow fissures; and that which I bring before you as yet undescribed and new to our fauna, belongs to the first class, and to the genus established by Dr. Bowerbank, under the name of *Microciona*.

The characters which distinguish the genus are thus set forth in the second volume of the "Spongiadæ," p. 7, as having "a common basal membrane, whence spring, at or about right angles to its plane, numerous separate columns of spicula, intermixed with keratode, furnished externally with spicula, which radiate from the columns, at various angles, towards the dermal surface of the sponge." Dr. Bowerbank has tabulated twelve varieties, all of

which are distinct and more or less interesting ; and that which he now calls *Microciona plumosa* has long been known to our naturalists, having been first described by Colonel Montague, who must have been very familiar with Paignton shore, under the name of *Spongia plumosa*. Here it grows abundantly, often in large patches, of a deep orange-red colour. Most of the genus hitherto described are found to range from a deep yellow to the deepest blood-red, as in *M. atrasanguinea* ; but that which I am about to describe is of a deep olive green when living, and of a pale olive tint when dry. So in colour it is distinct from all its congeners. But every student of the Spongiadæ knows that colour is a variable condition, and one must never rely on its being constant, when only one example has been discovered, as in this instance. Were this, then, the only difference, it could not stand as a variety. Fortunately, there is a structural distinction, which leaves this matter in no doubt whatever. Amongst the various forms of retentive spicules, none of the sponges of this genus, at present made known, have the bihamate form common to a large number of the silicious sponges. So, as these are found upon the membranes of the example under consideration, it is clearly a well-marked variety.

The small coating sponges, not only belonging to this but to allied genera, well deserve the attention of microscopists ; for without the microscope many would be utterly lost to us ; and all require that instrument to detect and display the minute and curious forms of spicula which are discoverable in their tissue—almost as difficult of resolution, and certainly as interesting, as the markings of the Diatomaceæ. Many of the *Microciona*, with the long flexuous columns of their skeleton, are singularly beautiful objects under the low powers, and cannot fail to interest the most common observer.

The sponge before you is but a small portion of that I discovered, but it was with difficulty I obtained it from its narrow secluded habitat. As you see, it covers a piece of the Red Sandstone, very thinly ; its stoutest part not rising above the eighth of an inch, whilst the average thickness is less than half that. Alive it was smooth, slightly undulating, sarcode abundant, neither oscula nor pores very distinct, the former few in number. In the dried condition, the oscula are more easily discernible ; they are dispersed and generally separate, but sometimes two are found together.

The skeleton columns are in length intermediate, not being quite so long as in *M. plumosa*, when the latter is fully developed and they

occasionally send out a branch. The basal and dermal membranes are alike in character, being thin and pellucid, both having a network of fine cylindrical spicula, the terminations acutely pointed, and with retentive spicula of the bihamate form, contort and sigmoid, of various sizes, though the smaller must, I think, be regarded as immature in growth. Besides these, are others of the anchorate description, though less in number, yet occasionally abundant. The larger kind is tridentate, palmate, equi-anchorate, with a few bidentate equi-anchorate. Of this latter is a smaller variety, more slender in character, having the teeth projected outwards somewhat like the barb of an arrow.

The interstitial membranes are also provided with the two classes of retentive spicula, at times in considerable quantities, often seen attaching themselves to the larger spicula of the skeleton, showing their office to be that of binding the membranes to it as well as together, thus warranting the term "retentive," which Dr. Bowerbank has given to them.

The columns of the skeleton are composed of acuate spicula, more or less spinous, but, like many of the genus, being more pronounced at the base. At the apices they often project through the membrane, giving a hispid appearance to the surface when the sponge is dry, but not visible in its living condition. Spicula of a similar character also project at various angles from the columns. Besides these there are smaller spicula attenuato-acuate entirely spined.

In calling attention to the analogies with known species, mention has already been made of *M. plumosa* in relation to the size of the skeleton columns. The spicula are very similar in character to many of the genus, but those of the skeleton are mostly like to those in *M. fictitia*, differing, however, from all in having no inflation at the base. The tridentate-palmate form in the membranes resembles that in *M. ambigua*, and the angulate-bidentate is found in no less than seven out of the twelve species already described. The bihamate forms, which are found alone in this species of the genus are sometimes so abundant on the dermal membrane as to appear closely matted together, especially between the intervals of the apices of the skeleton columns, and are of all sizes, some exceedingly minute, but undoubtedly these must be considered as immature, as before stated. A close examination of the membranes will amply repay the observer in minute structure. There is evidently order in

what at first sight would appear to be indiscrimination ; you may trace the bihamate spicules interlocking with each other, here and there held and hooked by the fluke of an anchorate form, and the more rarely observed bihamate reversed or sigmoid spicule may be seen twining about one of the skeleton, helping to hold on the membranes as well as to keep them together. (*Vid.* pl. I., fig. 5, 6).

The reproductive organs at present remain unknown, as I am not sure if the object seen in some of my preparations are other than small masses of sarcode. None of the so-called gemmules have been found in any of the genus except *M. armata*.

There are a greater variety of spicula in this species than in any of its class, reminding one very much of those in *Halichondria incrustans*, to which the bihamate forms seem to make an alliance. The latter are most abundant in those areas of the dermal membrane which lie between the projecting apices of the skeleton columns, when they sometimes interlace with each other in a curiously compact manner, and it is probable that here the pores would be found, but I could not perceive them.

Having thus given a general description of this most interesting species, it is now necessary to give it a name. Of course this is provisional, in case it may already have been described by another, or may be amongst those thirty or forty additions which our lamented friend Dr. Bowerbank had made since the publication of his third volume of the "*Spongiadæ*." Already, indeed, was this example packed with others to be sent for his inspection, when his death occurred. The name I propose has reference to its structural differences which the bihamate spicule gives us, viz., *Microciona bihamigera*.

Following Dr. Bowerbank's formula, the Sponge may be thus tabulated :—Sponge, coating, thin ; colour, when alive, olive green ; dry, a paler tint of the same. Surface smooth when alive, in the dry state somewhat hispid. Oscula dispersed, but sometimes two together. Pores inconspicuous. Dermal membrane thin, pellucid, spiculous. Spicula cylindrical, each end abruptly pointed, slender ; retentive spicula bihamate, contort and sigmoid, very numerous ; also tridentate, palmate, equi-anchorate, and a few bidentate equi-anchorate large and small dispersed. Skeleton columns long and sometimes branched. Spicula acuate, spinous, spines more pronounced at the base ; defensive spicula the same ; also shorter ones attenuato-acuate,

entirely spined. Interstitial membranes thin and pellucid ; spicula same as dermal membrane. Habitat, Paignton Rocks, Torbay.

DESCRIPTION OF PLATES I. AND II.

PLATE I.

- Fig. 1.—*Microciona bihamigera*. Sponge full size, coating a piece of the New Red Sandstone.
Fig. 2.—Spicule of skeleton. 400 diam.
Fig. 3.—Smaller ditto. 400 diam.
Fig. 4.—Cylindrical spicule of dermal membrane. 400 diam.
Fig. 5, 6.—Groups of bihamate and anchorate spicules from the membranes. 725 diam.
Fig. 7.—Portion of the dermis showing the arrangement of bihamate spicules. 80 diam.
Fig. 8.—Tridentate, equi-anchorate, palmate spicule of the membranes. 1150 diam.
Fig. 9.—Bidentate ditto. 1150 diam.
Fig. 10.—Bihamate ditto. 725 diam.

PLATE II.

Exhibits a section of the sponge at right angles to its surface, showing, arrangement of the skeleton columns. Some of these are disrupted from their bases of attachment. *a*, shows reticulation of dermal membrane, and some spicules projecting through the latter. 80 diam.
